Weekly Report – week of June 27, 2011
Fabrication and Assembly of ERL hardware
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Cryogenics: The 5 Cell ERL Cold Test for LLRF testing took place 6/30. The field instrumentation termination is postponed due to powering up of PLC racks for cold test. Termination of field instrumentations of cryoplant will continue after the coldest.

Controls: A beta version of the software interface for Kepco power supplies is ready for testing, for which final hardware preparations are underway. In addition, a reflected data server has been set up that will support the viewing and logging of digitized RF signals in order to improve system performance during periods of high data utilization.

Instrumentation: We are reviewing the proposed ERL extraction DCCT non-bakeable mechanical mount and shroud structure which provides a larger aperture than the injection DCCT. The mechanical drawings of a low energy profile monitor were provide to the extraction line mechanical engineer for installation considerations. We have resolved the positioning of the high-energy profile monitor straight out of the gun, the actuator will be located at beam right to avoid conflicts and allow the optics box to be mounted on top. A teleconference was held with Radiabeam to review their response the 17 action items raised after the BNL tests of the profile monitor first article. Agreements were reached on all items, we will receive follow up information as requested. The PMT based BLM was tested on the bench using the RHIC BLM FE electronics, a signal polarity issue is being investigated, testing will continue. Software testing continues on the Linux interface to the FireWire CCD cameras on a multi camera hub. A BPM button & cube assembly was mounted on the automated wire scanner bench. A BPM impedance matching assembly is being fabricated to improve signal response during bench testing. A draft electronics rack layout is available for subsystem expert to review.

Laser: The new window design for the transport line has been successfully tested, and we will make 6 more (1 spare) in the Central shops. The Liebert air conditioner has been fixed, leaving just the drainage problem with the auxiliary unit, but the environment is good enough to run the laser again.

FPC conditioning: The ERL FPC are being tested, we have reached 13kw and will continue testing after the cold test of the 5 cell cavity LLRF. We have received water mats and will install them on the air side inner conductor as a safety precaution. We still need to understand the water flow rates for proper cooling at high power operations.

Photocathode: The first attempt of making a multialkali photocathode in the deposition is in progress. We have successfully deposited Antimony (Sb) and Cesium (Cs). The Potassium (K) arm still shows high levels of water. A plan has been

made to do a higher temperature bake and install additional pumping directly on the source arms. We have received a quote for adding turbos to the source arms during degassing and initial bake and pump down. Ion pumps will also be added to maintain better vacuum near the alkali sources.

Gun Cryomodule: The gun and string assembly are being processed at J-Lab. The transport cart upgrade continues to make progress.

PASS System: The installation and testing of the VTF PASS system is moving forward.

Mezzanine: An RFQ to raise the mezzanine two feet has been prepared. Review of 3 RFP's for the installation of a clean room under the mezzanine is in progress. A meeting will be scheduled to review the comments of the evaluation committee.

Large Grain Gun: Cavity is currently being processed at Jefferson Laboratory. Heavy BCP activities have been completed and cavity is currently awaiting final BCP and high-pressure rinsing along with final vacuum assembly in cleanroom. Progress has been made regarding safety arrangements at the facility where large-grain gun testing will take place: an RGD permit is in the process of being issued that will allow testing under a variety of radiation conditions including those that apply to the large grain gun.

5-cell cavity/cryomodule: The paperwork continues for the G-5 test safety review. The surveyors continue to verify locations of the faraday cups (beam dumps) for the G-5 test. The 5 cell run to test the LLRF feedback loop took place June 30th. Three basic types of testing were performed:
1) CW Digital PLL mode to lock the LLRF to the cavity resonant frequency.
2) CW IQ Feedback for cavity amplitude and phase regulation.
3) Pulsed response using PLL and IQ Feedback.

ERL injection line: Vacuum envelope is in preparation to final review, correction magnets are under design.

ERL Extraction line: Magnets are being fabricated; beam dump pressure vessel code compliance under evaluation, vacuum/instrumentation layout needs to be reviewed and finalized.

ERL Tech Support Area: The EEBA area is on hold due to funding issues. Design drawings and cost estimates have been completed. Due to funding constraints for the construction of the enclosure and refurbishment of this area this work in now on hold.

ERL Vacuum Support: Injection zig-zag beamline support detail design continues. New 10x20 cleanroom in 905 operational. AC for existing 905 class 100 clean room functional. Chamber processing and assembly for G5 beamline continues.

Additional ducting and condensate handling planned. New details for laser transport window retainers and vacuum sealing for easy exchange have been designed, prototype fabricated and tested.

Management: The project is out of funds. Orders are being stopped.